ZOOLOGY.—*New cleidogonid millipeds* (*Chordeumoidea*). NELL B. CAUSEY, Fayetteville, Ark. (Communicated by H. F. Loomis.)

Their dark color, retiring habits, and small size make collection of cleidogonid millipeds difficult, but with patience they can be found in almost any damp humus in the Mississippi Valley, the states east of it, and in Central America. Inasmuch as species are rather endemic, doubtless numerous others are yet to be discovered. A key to the genera will be found in the survey of the Family Cleidogonidae by Hoffman (1950).

I am indebted to Dr. M. W. Sanderson for the opportunity of studying specimens of *Cleidogona fustis* Cook and Collins and the type specimens of *C. inflata* and *C. unita*, all of which are in the collection of the Illinois Natural History Survey. The type specimens of *C. minima*, *C. aspera*, *Ozarkogona glebosa*, and *Tiganogona moesta* will be deposited in the collection of the Academy of Natural Sciences of Philadelphia. Unless stated otherwise, collection was by the author.

Cleidogona fustis Cook and Collins

The two male specimens from Turkey Run State Park, Montgomery County Ind., are in the Illinois collection. This is the only published locality of this species.

Cleidogona aspera, n. sp.

Figs. 1–4

This species is near *C. laminata* Cook and Collins in the structure of the gonopods and in the modification of the legs of the male. The two species are separated by differences in the longest processes of the gonopods, which are fimbriate in *laminata* and bifid in *aspera*.

Male holotype.—Color brown above and laterally, with the usual areolate buff maculae; cream below; legs cream except the tarsi, which are brown; antennae and vertex of head brown; ocelli dark, forming a triangular patch, arranged in rows of 7, 6, 5, 3, 3, 2, 1.

The ninth legs are almost as in *laminata;* on the mesial surface of the first segment is a deep, rectangular depression, its laterad surface and the area immediately distad finely granular. The glandular openings on the first segments of the tenth and eleventh legs are as in *laminata*. The sternal process at the base of the twelfth legs is distinctive in the shape of the spine (Fig. 1).

As in *laminata*, the ventral branch of each gonopod ends in three processes, the ventral one resembling the head of a bird, the longest one, unlike *laminata*, finely bifid distally, and the third and shortest one subquadrate and attached to the base of the longest process. The dorsal branch of each gonopod is somewhat flattened vertically; there is no notch on the medial face, as in *laminata*. Ventral, dorsal, and lateral views of the gonopods are shown in Figs. 2, 3, and 4, respectively.

Length about 20 mm, *width* 2.1 mm.

Female paratype.—Resembles the male in size and color; ocelli arranged in rows of 1, 7, 6, 5, 4, 3, 2.

Type locality.—Arkansas: Lawrence County, 6 miles east of Imboden on highway 62; 7 males and 7 females were collected from a dry oak-cedar area, August 22, 1950.

Other localities.—One male, Pocahontas, Randolph County, Ark., August 22, 1950. One male collected by Billy C. Rogers, Carthage, Dallas County, Ark., October 8, 1950, differs from the holotype in that the ventral processes of the gonopods are less like the outline of a bird's head and the ocelli are arranged in rows of 1, 7, 6, 5, 4, 3, 1, 1.

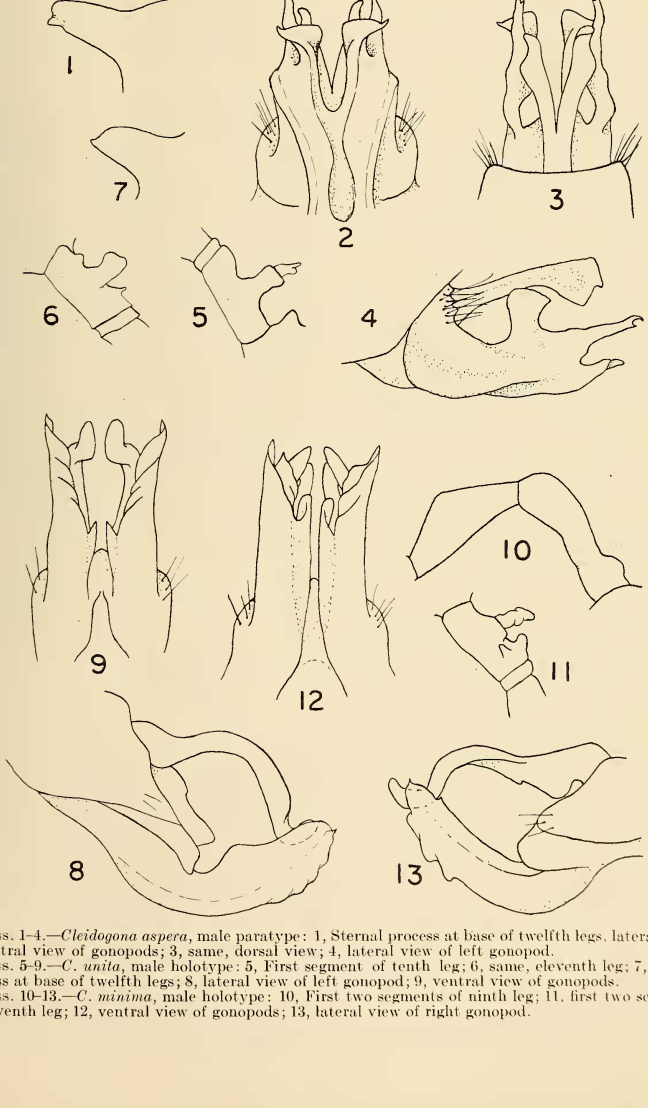
Cleidogona unita, n. sp.

Figs. 5–9

The ninth legs of the males of this species resemble those of *C. caesioannulata* (Wood) as drawn by Cook and Collins (1896), but the details of the gonopods are nearest those of *C. minima*.

Male holotype.—Color brown above and laterally, with the usual aerolate buff maculae, the prozonites lighter than the metazonites; cream below; legs cream except the tarsi, which are brown; antennae and vertex of head brown; ocelli dark, forming a triangular patch, arranged in rows of 7, 6, 5, 4, 3, 1 (2).

The ninth legs are as shown by Cook and Collins for *C. caesioannulata* (Wood). The first segments of the tenth and eleventh legs (Figs. 5, 6) have prominent cones on the mesial surface through which the coxal glands open. The sternal



Figs. 1–4.—*Cleidogona aspera*, male paratype: 1, Sternal process at base of twelfth legs, lateral view; 2, ventral view of gonopods; 3, same, dorsal view; 4, lateral view of left gonopod.

Figs. 5–9.—*C. unita*, male holotype: 5, First segment of tenth leg; 6, same, eleventh leg; 7, sternal process at base of twelfth legs; 8, lateral view of left gonopod; 9, ventral view of gonopods.

Figs. 10–13.—*C. minima*, male holotype: 10, First two segments of ninth leg; 11, first two segments of eleventh leg; 12, ventral view of gonopods; 13, lateral view of right gonopod.

process at the base of the twelfth legs is shown in Fig. 7.

The gonopods consist of a wide, dorso-ventrally flattened ventral branch and a cylindrical, sigmoidal dorsal branch (Figs. 8, 9). The ends of the ventral branches are smoother and their medial longitudinal processes are shorter and narrower than in *C. minima*.

Length about 14 mm.

Type locality.—Illinois: Union County, Giant City State Park. The male holotype and two females were collected March 6, 1945, by Drs. H. H. Ross and M. W. Sanderson. The same collectors took a male and a female March 17, 1942, at Dixon Springs, Ill.

Cleidogona minima, n. sp.
Figs. 10–13

Although the gonopods of this species resemble those of *C. unita* very closely, the two can be distinguished by the differences in size, in the details of the medial processes and ends of the ventral branches of the gonopods, and by the legs of the males.

Male holotype.—Color brown above with buff maculae, cream below; segmental setae set in small buff maculae, those at medial setae largest; legs dark distally, cream proximally; antennae and vertex of head dark brown; ocelli dark, forming a triangular patch, arranged in rows of 7, 6, 5, 3, 2, 1.

The first two segments of a ninth leg are shown in Figure 10, and the first segment of an eleventh leg, with two small conical projections on the mesial surface above the opening of the coxal gland, in Fig. 11. The sternal process at the base of the twelfth legs is similar to the one in *C. unita* (Fig. 7).

Each gonopod consists of a cylindrical, sigmoidal dorsal branch and a larger, dorso-ventrally flattened ventral branch. The medial longitudinal process is rolled and larger than the similar process in *C. unita*. Distally the ventral branches are emarginate and sharper than in *C. unita* (Figs. 12, 15).

Length 11 to 12 mm.

Locality.—Alabama: Tuscaloosa. One specimen collected November 9, 1949, from under pine bark on the campus of the University of Alabama was sent to me by Dr. R. E. Crabill, Jr.

Cleidogona inflata, n. sp.
Figs. 14–19

This species is nearest *C. leona* Chamberlin, with the ventral branches of the gonopods large and inflated and the dorsal branches small and simple.

Male holotype.—Color brown above and laterally, with the usual areolate buff maculae; cream below; legs cream except the tarsi, which are brown; antennae and vertex of head brown; ocelli dark, forming a triangular patch, arranged in rows of 1, 7, 6, 5, 4, 3, 2.

On the mesial surface of the first segment of the ninth legs there is a shallow depression and beyond it a sharp lobe (Fig. 14). The first segments of the tenth and eleventh legs, each with an apophysis near the opening of the coxal gland, are shown in Figs. 15 and 16. The sternal process at the base of the twelfth legs is distinctive in the slightly constricted base (Fig. 17).

The large ventral branch of each gonopod terminates in three processes, the lateral one sigmoid and darkly pigmented distally and the other two shorter and lanceolate; the dorsal branches are small and hamate (Fig. 19). *In situ* (Fig. 18) only the ventral branches are visible, their terminal processes outlined against the enlarged body of the branches.

Length about 17 mm.

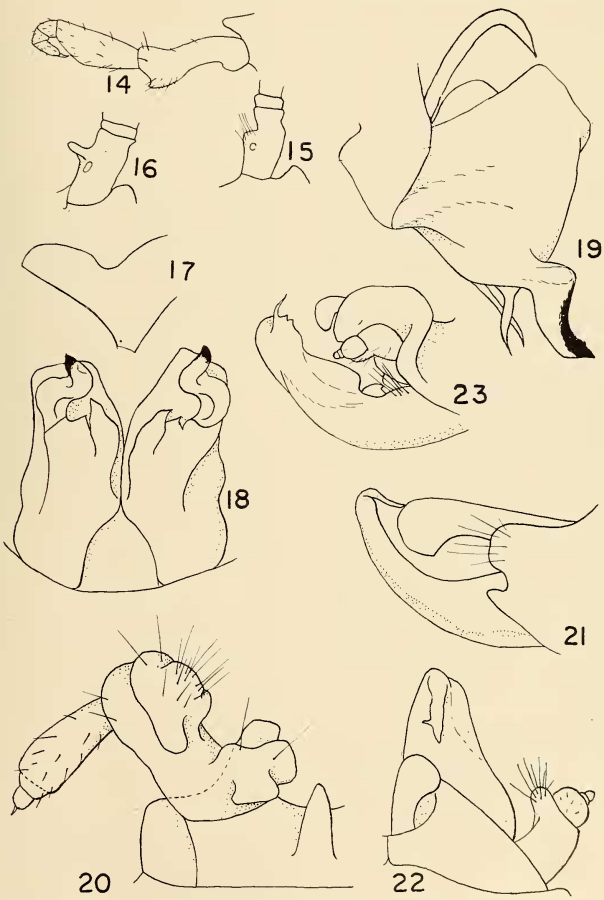
Type locality.—Illinois: Putnam County, Starved Rock State Park. The holotype, a female, and a larva were collected July 12, 1944, by Drs. T. H. Frison and M. W. Sanderson. One male, same collectors, August 14, 1944, White Pines State Park, Ogle County, Ill.

Ozarkogona, n. gen.

This genus resembles *Cleidogona* in body shape, absence of keels, smooth surface, shape of first segment, proportion of antennal segments, and in the structure of the gonopods, each of which consists of a hamate ventral branch and a shorter, clavate dorsal branch. The males are distinguished from *Cleidogona* by the absence of a medial sternal process at the base of the twelfth legs and by the ninth legs, which are 4-jointed and with a claw, the first joint enlarged as in *Bactropus*, the second cylindrical and without lobes, the third much shortened, and the fourth narrow but slightly longer than the third. It

differs from *Bactropus* in that the ninth legs are 4-jointed rather than 5-jointed and in the 2-branched gonopods. Gnathochilarium as in *Cleidogona*. Eyes triangular, composed of about 27 dark ocelli.

Genotype.—*Ozarkogona glebosa*, n. sp.



FIGS. 14–19.—*Cleidogona inflata*, male holotype: 14, Ninth leg; 15, first segment of tenth leg; 16, same, eleventh leg; 17, sternal process at base of twelfth legs; 18, gonopods *in situ*, 19, lateral view of left gonopod.

FIGS. 20–21.—*Ozarkogona glebosa*, male paratype: 20, Cephalic view of ninth leg and sternum; 21, lateral view of right gonopod.

FIGS. 22–23.—*Tiganogona moesta*, male paratype: 22, Caudal view of ninth leg and end of dorsal branch of gonopod; 23, lateral view of right gonopod and ninth leg.

Ozarkogona glebosa, n. sp.
Figs. 20, 21

Male holotype.—Color brown above, cream below; segmental setae set in small buff maculae; larger buff maculae arranged so that there appear to be a lateral buff band and a brown band below it; legs dark distally, cream proximally; antennae and vertex of head brown; ocelli dark, arranged in rows of 1, 7, 6, 5, 4, 3, 2.

The ninth legs (Fig. 20) consist of four segments; the fourth segment is short and ends in a short claw; the third is shorter but thicker; the second is thicker and about three times as long as the combined length of the third and fourth; the first is much enlarged, and on its cephalic surface are two large irregular lobes. The second and third segments appear almost coalesced, and midway of the first segment is an indistinct line that may indicate the coalescence of two segments. The third and fourth segments and the distal parts of the second are brown. A medial sternal process is anterior to the ninth legs, and posterior to them is a wide bifid plate. The gland openings on the first segments of the tenth and eleventh legs are but slightly raised; on the mesial surface, proximal end of the third segments of these legs is a low, cylindrical process.

In situ only the medial portion of the appressed ventral branches of the gonopods is visible. In lateral view (Fig. 21) each gonopod is seen to consist of a hamate ventral branch, the end sharp and directed laterad, and a shorter, thick, dorsal branch terminating in a club. *In situ* the dorsal branches pass between the sternal spine and the proximal lobes of the first segment of the ninth legs, while the ventral branches pass under the distal lobes.

Length about 16 mm.

Type locality.—Arkansas: Fayetteville; 5 males from north end of Mount Kessler, November 10, 1949. Other Arkansas collections have been made at Monte Ne, Benton County; Cane Hill, Washington County; and Clarksville, Johnston County.

Tiganogona Chamberlin, *emend.*

Tiganogona Chamberlin, Ent. News **39:** 154. 1928.

A recent examination of specimens of *T. brownae* Chamberlin, the genotype, from St. Charles, Mo., shows that the very small ninth legs were overlooked by Dr. Chamberlin, that he described the tenth legs as the ninth, the eleventh as the tenth, and that his reference to a protuberance on the second joint should be to the third joint. Accordingly, the following emendation must be made: Differing from *Cleidogona* in the ninth legs of the male, which are smaller, 5-jointed, and without a terminal claw; the first segment, the largest, is produced ventrally and may be embraced medially by the dorsal branch of the gonopod; the second segment is much reduced; the third is smaller than the second, and the fourth and fifth segments are minute. Each gonopod consists of two pieces, a dorsally curved ventral branch and a shorter and simpler dorsal branch. Although the ninth legs are minute as in *Ozarkogona*, these two genera are readily separated by the difference in the number of segments and the proportions of the segments of the ninth legs.

T. brownae is represented in the Illinois collection by one male from Burton, Ill.

Tiganogona moesta, n. sp.
Figs. 22, 23

Male holotype.—Color brown above, cream below; dorsal segmental setae set in small buff maculae; medial and lateral segmental setae set in larger, contiguous buff maculae which form a longitudinal band; a brown band is below the buff one; legs cream proximally, brown distally; antennae and vertex of head brown; coelli dark, forming a triangular patch, arranged in rows of 1, 7, 6, 5, 4, 3, 2.

The ninth legs are so small they could be overlooked, but they are made more conspicuous by the brown pigment on the distal three segments. The dorsal branches of the gonopods pass between the first segments and come to rest on the caudal surface; the lobe on the mesial surface of the second segment is almost as large as the globular third segment; segment four is minute; segment five is slightly larger and without a claw (Fig. 23). The first segments of the tenth and eleventh legs are slightly inflated and with the usual gland opening on the mesial surface; on the tenth legs there is a transverse ridge on the cephalic surface of the first segment and a rounded lobe on the proximal end of the mesial surface of the third segment.

The ventral branches of the gonopods are flattened dorso-ventrally distally and curved

gently upward and outward, so that *in situ* part of the dorsal branches and the first segments of the ninth legs are visible between them (Figs 22, 23). The shorter dorsal branches pass between the first segments of the ninth legs and their clavate ends rest on the caudal surface of these segments. Near their base, the ventral branches pass closely around a medial knoblike protuberance that appears to be a sternal process.

Length about 15 mm.

Type locality.—Arkansas: Carroll County, Blue Spring; two males, October 29, 1949. The species has been collected at Fayetteville, Washington County, also.

ICHTHYOLOGY.—*Additions to the known fish fauna of Mexico: Three species and one subspecies from Sonora.* Robert Rush Miller and Howard Elliott Winn, Museum of Zoology, University of Michigan.

During an ichthyological survey of the Gila River Basin of Arizona, New Mexico, and northern Mexico, in the spring of 1950, the writers made the first fish collections to be recorded from the San Pedro River in Mexico. This stream, once a permanent tributary to Gila River, originates near Cananea in northern Sonora, where peaks of the Cananea Range rise to over 8,000 feet. The surrounding country is open and extremely dry, however, and 15 miles distant, at San Pedro Ranch, the average annual rainfall for the period 1935–1949, inclusive, was only 12 inches (data kindly supplied by Nicholas Sherbakov, San Pedro Ranch). Four collections were made along the main river and in two of its tributaries in the vicinity of San Pedro Ranch, which lies on Río San Pedro about 8 miles south of the international boundary line. The elevation of the ranch is approximately 4,500 feet.

On September 10, 1943, James R. Simon investigated San Bernardino Creek, about 18 miles east of Douglas, Ariz. This stream rises about 2 miles north of the international boundary line and then flows south into Sonora, Mexico, eventually to join Río Yaqui. About 1 mile below the border he took a catfish and a sunfish that constitute new records for Mexico. Neither species is native to the Republic west of the Continental Divide.

The following species are recorded for the first time from Mexico; the specimens are deposited in the University of Michigan Museum of Zoology:

Catostomus insignis Baird and Girard

The Gila coarse-scale sucker was fairly common just above the ranch of Don Rafael Elias, about 6 miles southwest of San Pedro Ranch, where 13 half-grown and 3 large adults (68–112 and 264–290 mm in standard length) were secured; only one half-grown (114 mm), seined at night, was taken above the large rock dam 2 to 3 miles west of Elias Ranch. Both localities are on a tributary to Río San Pedro, called locally Río San Rafael, which joins the main river about 4 miles upstream from San Pedro Ranch. The specimens were collected by the authors and Frances H. Miller on April 21–22, 1950. One large female extruded ripe eggs under slight pressure, indicating that spawning was imminent or in progress. The water was 73°F., the air 85°F. at 3 p. m.

Tiaroga cobitis Girard

The loach minnow was taken on April 22 in Río San Pedro, at its junction with Río San Rafael, about 4 miles south of San Pedro Ranch. Only 4 adults (37 to 48 mm long), from two rocky riffles, were secured. One riffle was about 25 feet long and formed three rivulets each 1 to 2 feet wide and about 2.5 inches deep. The other riffle, which lay at the head of an undercut pool, was about 8 feet long, up to 4 inches deep, and 2 to 3 feet wide. A long, shallow sandy stretch of approximately 140 feet lay between. The rocks were covered with a short growth of dense green algae and the river was entirely exposed to the bright sun. By using derris root, we obtained this meager sample of a species which undoubtedly was common in the Mexican portion of this river before its flow had become so drastically reduced.

Ameiurus melas (Rafinesque)

Black bullheads were abundant along Río San Rafael, just above the ranch of Don Rafael Elias and in the large reservoir 2 to 3 miles to